DENON

Hi-Fi Stereo Power Amplifier

For EUROPEAN MODEL

SERVICE MANUAL

MODEL POA-3000Z

SOLID STATE
STEREO POWER AMPLIFIER

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NIPPON COLUMBIA CO., LTD.

NOV. 1984

SPECIFICATIONS

POWER AMPLIFIER SECTION

Rated output power: (Both channel driven)	250 watts per channel minimum RMS. both channels driven at 8 ohms from 20 Hz – 20 kHz no more than 0.008%. 300 W + 300 W (6 ohms) 20 Hz – 20 kHz 250 W + 250 W (8 ohms) 20 Hz – 20 kHz
Total harmonic distortion:	0.002% (–3 dB at rated output, 8 ohms)
Intermodulation distortion:	Less than 0.0015% (60 Hz/7 kHz: 1/4 at rated output, 8 ohms)
Power bandwidth:	5 Hz – 80 kHz (8 ohms, THD 0.01%)
Frequency response:	1 Hz – 300 kHz +0, –3 dB (at 1 W)
Input sensitivity:	1 V (Normal) 1.41 V (High cut filter in)
Input impedance:	18 k ohms (High cut filter in) 18 k ohms (Normal) 25 k ohms (High cut filter in)
Output impedance:	0.08 ohms (1 kHz)
Signal-notice ratio:	123 dB (A-weighing)
High cut filter:	40 kHz, 6 dB/oct (High cut filter in)
Subsonic filter:	16 Hz, 6 dB/oct
Slew rate:	±500 V/μ sec

LEVEL METERS

Indication type:	Peak level type indication (output level meter)
Meter range:	–50 dB – +5 dB (0 dB = 200 W/8 ohms)
Frequency response:	10 Hz – 100 kHz +0, –3 dB (at 1 W)
OUTPUT TERMINALS:	Speakers 6 – 16 ohms
SELF-DIAGNOSTIC FUNCTIONS:	Display lights indicate abnormal operating temperature, right and left channels malfunctions.

GENERAL

Power supply:	AC 120 V, 60 Hz (for U.S.A. & Canada) AC 220 V, 50 Hz (for Europe) AC 240 V, 50 Hz (for UK & Australia)
Power consumption:	400 W (for Hong Kong & Singapore) 490 W (for U.S.A.) 490 W (for Europe)
Dimensions:	493 (W) x 199 (H) x 480 (D) mm (Including control knobs and feet)
Weight:	30 kg

* Specifications are subject to change without notice.

NOTE: The following codes correspond to the appropriate models.
E1 for Asia, E2 for Europe, E3 for U.S.A., EA for Australia, EC for Canada and EF for France.
This Service Manual is prepared based on E2.

BLOCK DIAGRAM

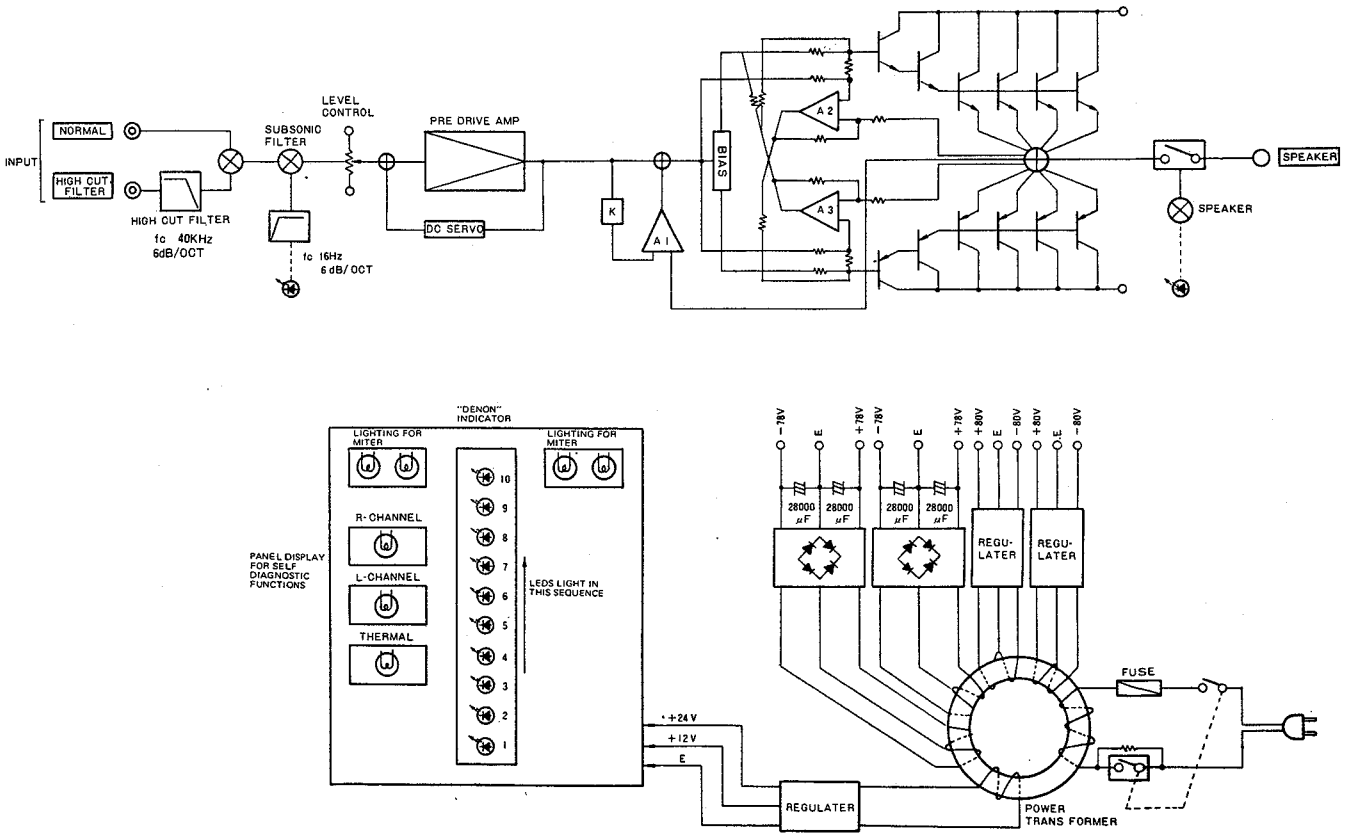


Fig. 1

CONTROLS AND FUNCTIONS

• FRONT PANEL

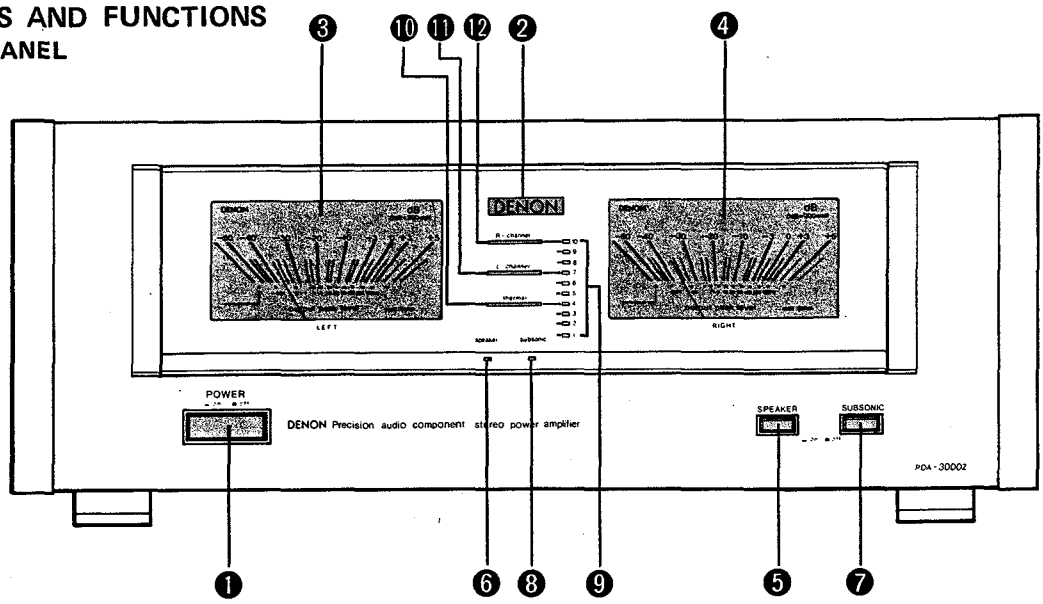


Fig. 2

① POWER (Power Switch)
② POWER INDICATOR
③ ④ OUTPUT PEAK LEVEL (Output Peak Level Meter)
⑤ SPEAKER (Speaker Switch)
⑥ SPEAKER INDICATOR
⑦ SUBSONIC (Subsonic Filter Switch)
⑧ SUBSONIC INDICATOR
⑨ MUTING COUNTER
⑩ ⑪ ⑫ SELF-DIAGNOSTIC FUNCTION INDICATORS
⑩ TEMPERATURE RISE WANING INDICATOR
⑪ WARNING INDICATOR LEFT CHANNEL POWER STAGE IRREGULARITIES
⑫ WARNING INDICATOR FOR RIGHT CHANNEL POWER STAGE IRREGULARITIES

• REAR PANEL

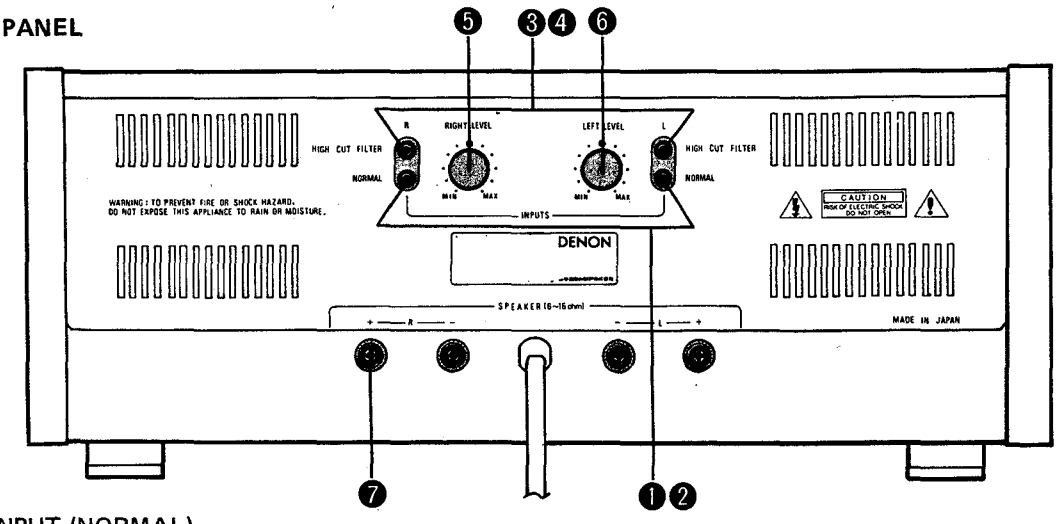


Fig. 3

① ② INPUT (NORMAL)
③ ④ INPUT (HIGH CUT FILTER)
⑤ RIGHT LEVEL (Right Channel Input Level Control)
⑥ LEFT LEVEL (Left Channel Input Level Control)
⑦ SPEAKERS (Speakers Terminals)

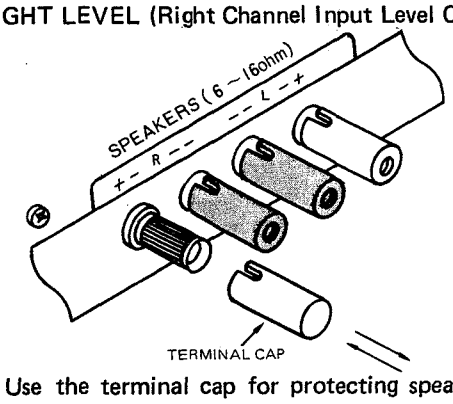
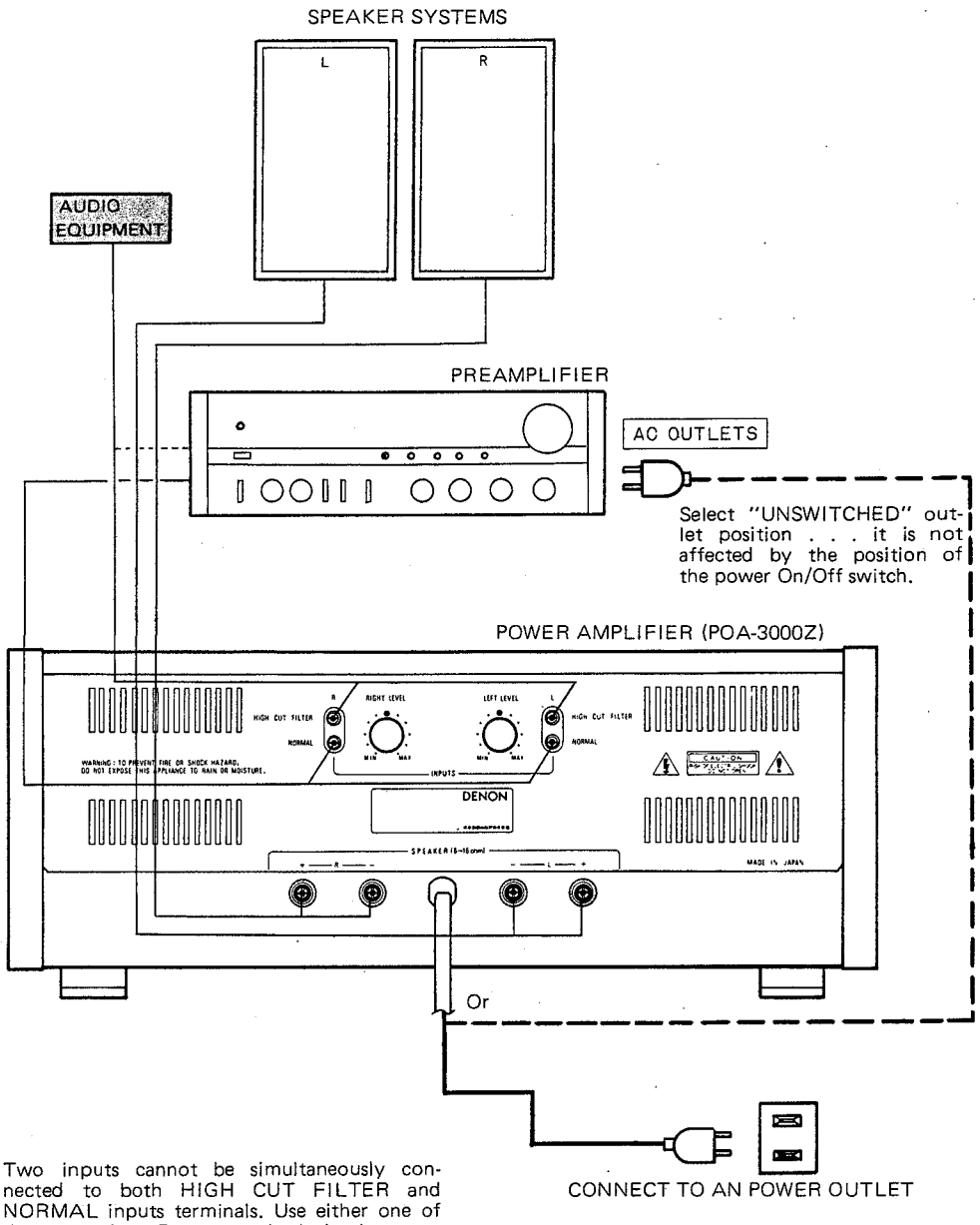


Fig. 4

Matching impedance
Recommended speaker impedance is between 6 and 16 ohms.

Note: Use the terminal cap for protecting speaker terminals. Insert as shown in the Figure 4, after speaker cords are connected. A high voltage is generated at speaker terminals connected to the POA-3000Z high-power amplifier. Always use the terminal cap to prevent accidental contact. Touching exposed portions of terminals and speaker cords may be dangerous. This will also prevent impact damage to the terminals.

CONNECTIONS



Note: Two inputs cannot be simultaneously connected to both HIGH CUT FILTER and NORMAL inputs terminals. Use either one of them at a time. Do not use both simultaneously. Do not short unused terminals.

Fig. 5

CONNECTION PRECAUTIONS

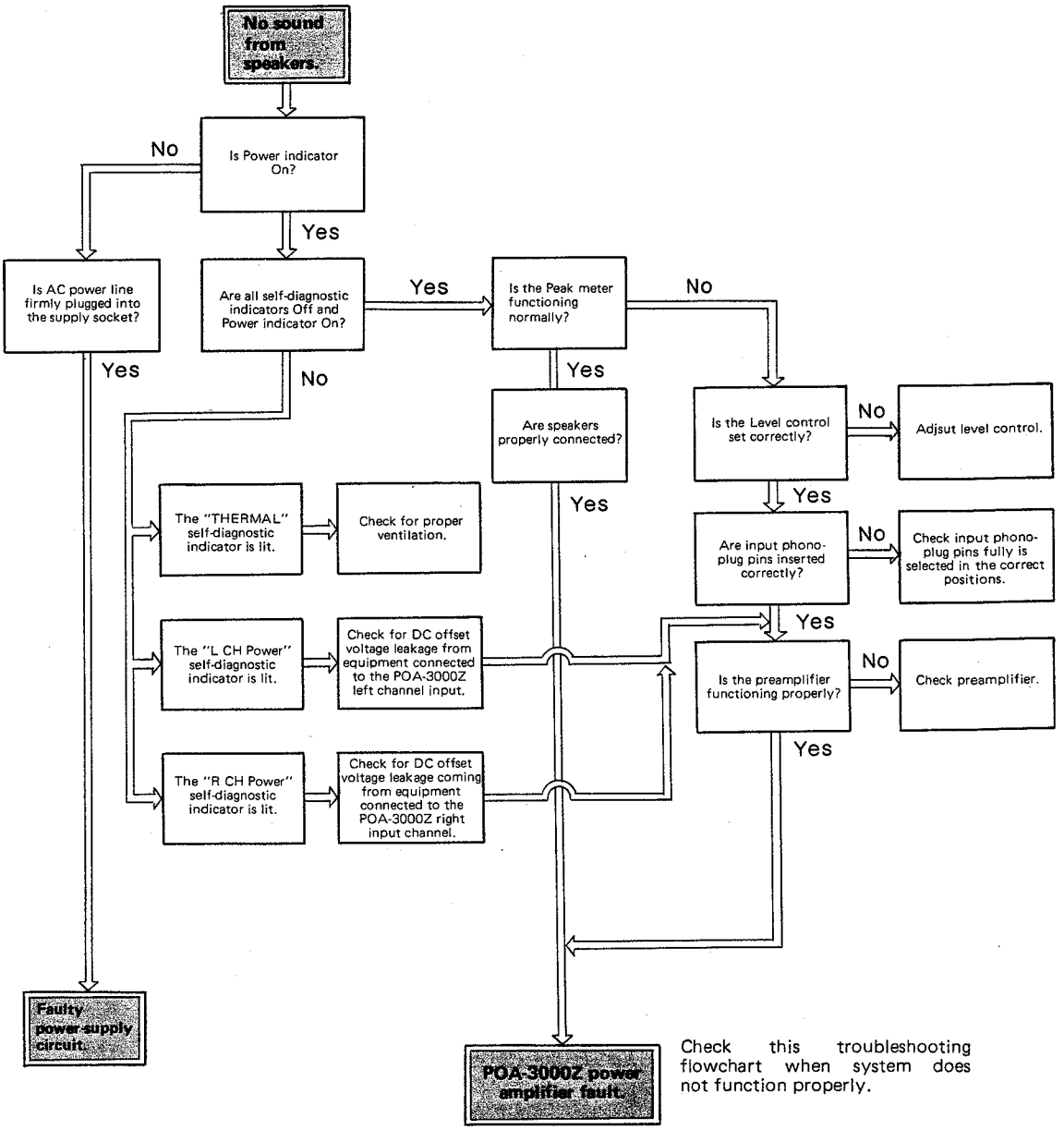
- When making connections, make sure that the power is turned OFF.
- Make sure that the L output terminal of the preamplifier (or other audio equipment) is connected to the L input terminal of the POA-3000Z. Also check that the R output terminal of the preamplifier (or other audio equipment) is connected to the R input terminal of the POA-3000Z. Connect the cords going to the left speakers to the L terminals of the POA-3000Z and the right speaker cords to the R terminals of the POA-3000Z.
- Make secure connections. If connections are not secure, noise or loss of sound output may occur.
- Do not bundle pin plug cords with the power cords: Please pin plug cords away from power supply transformers since hum or noise may occur.

TROUBLE SHOOTING

Before assuming an amplifier fault, check the following:

1. Are all connections made properly?
2. Are operations correct?
3. Are speakers and preamplifiers functioning properly?

When the POA-3000Z is not functioning normally, check the following troubleshooting flowchart. The details corrective action you can follow, without a service representative. If you have any doubts or questions, contact your nearest DENON dealer.


No sound from speakers.
Is Power indicator On?
No
Yes
Is AC power line firmly plugged into the supply socket?
Are all self-diagnostic indicators Off and Power indicator On?
Yes
No
Is the Peak meter functioning normally?
Yes
No
Yes
No
Are speakers properly connected?
Is the Level control set correctly?
No
Adjsut level control.
Yes
The "THERMAL" self-diagnostic indicator is lit.
Check for proper ventilation.
Yes
Are input phono-plug pins inserted correctly?
No
Check input phono-plug pins fully is selected in the correct positions.
Yes
The "L CH Power" self-diagnostic indicator is lit.
Check for DC offset voltage leakage from equipment connected to the POA-3000Z left channel input.
Is the preamplifier functioning properly?
No
Check preamplifier.
Yes
The "R CH Power" self-diagnostic indicator is lit.
Check for DC offset voltage leakage coming from equipment connected to the POA-3000Z right input channel.
Faulty power supply circuit.
POA-3000Z power amplifier fault.

Check this troubleshooting flowchart when system does not function properly.

Fig. 6

METHOD OF ADJUSTMENTS

1. Adjustment of Idle Current (PUX0032B)

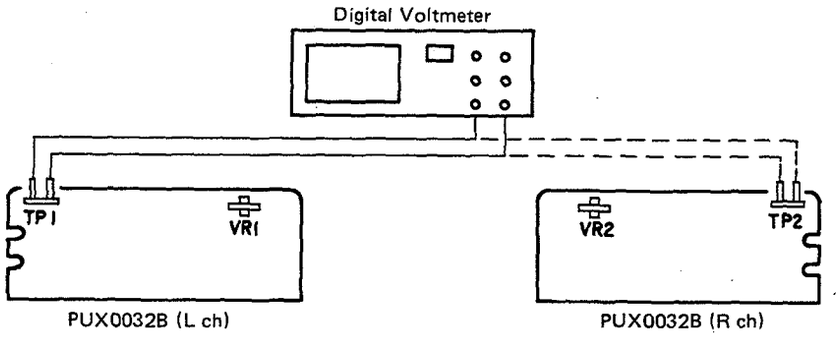


Fig. 7

(1) Connect a digital voltmeter to the test point.
(2) Turn the unit power on.
(3) Wait 2~3 minutes for warm-up, rotate VR1: Lch (VR2: Rch) and adjust voltage value on the meter to 13 mV ± 1 mV.

2. Adjustment of Neutral Point Voltage

(1) Connect a digital voltmeter to the SPEAKER terminal.
(2) Turn the unit power on.
(3) Turn the LEFT LEVEL and RIGHT LEVEL controls on the rear panel fully clockwise (maximum).
(4) Confirm the voltage on the meter indicates within ±100 mV value.

3. Adjustment of Meter (ETC0655B-1)

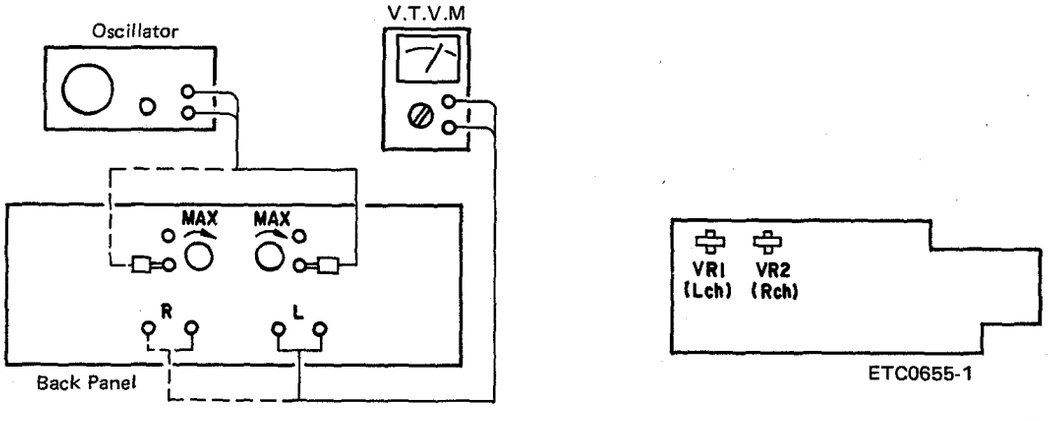


Fig. 8

(1) Connect a audio oscillator to the NORMAL INPUT terminal.
(2) Connect a VTVM to the SPEAKER terminal.
(3) Turn the unit power on and rotate the LEFT LEVEL and RIGHT LEVEL controls on the rear panel extremely clockwise (maximum).
(4) Adjust the oscillator output level and obtain 12.65 V output on the meter.
(5) Adjust VR1: Lch (VR2: Rch) on the ETC0655B-1 so that the meter indicates −10 dB.
(6) Increase the oscillator output 10 dB and confirm the value on the meter indicating 0 dB ±2.0 dB.
(7) Decrease the oscillator output 20 dB confirm that the meter indicates -20 dB ±5 dB.

4. Adjustment of Distortion Factor (PUX0032B)

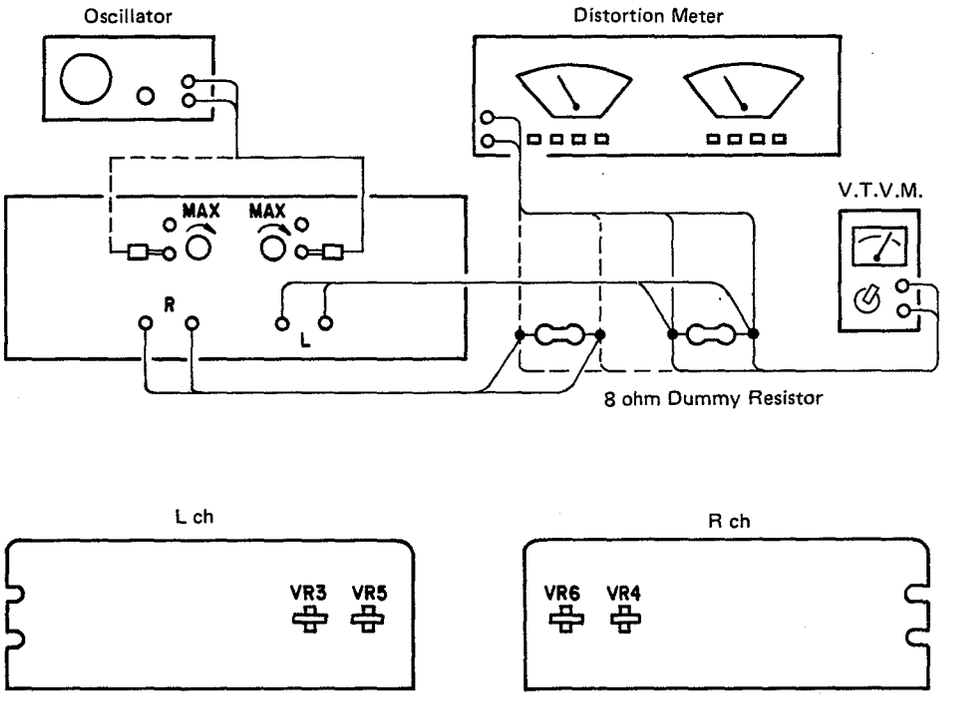


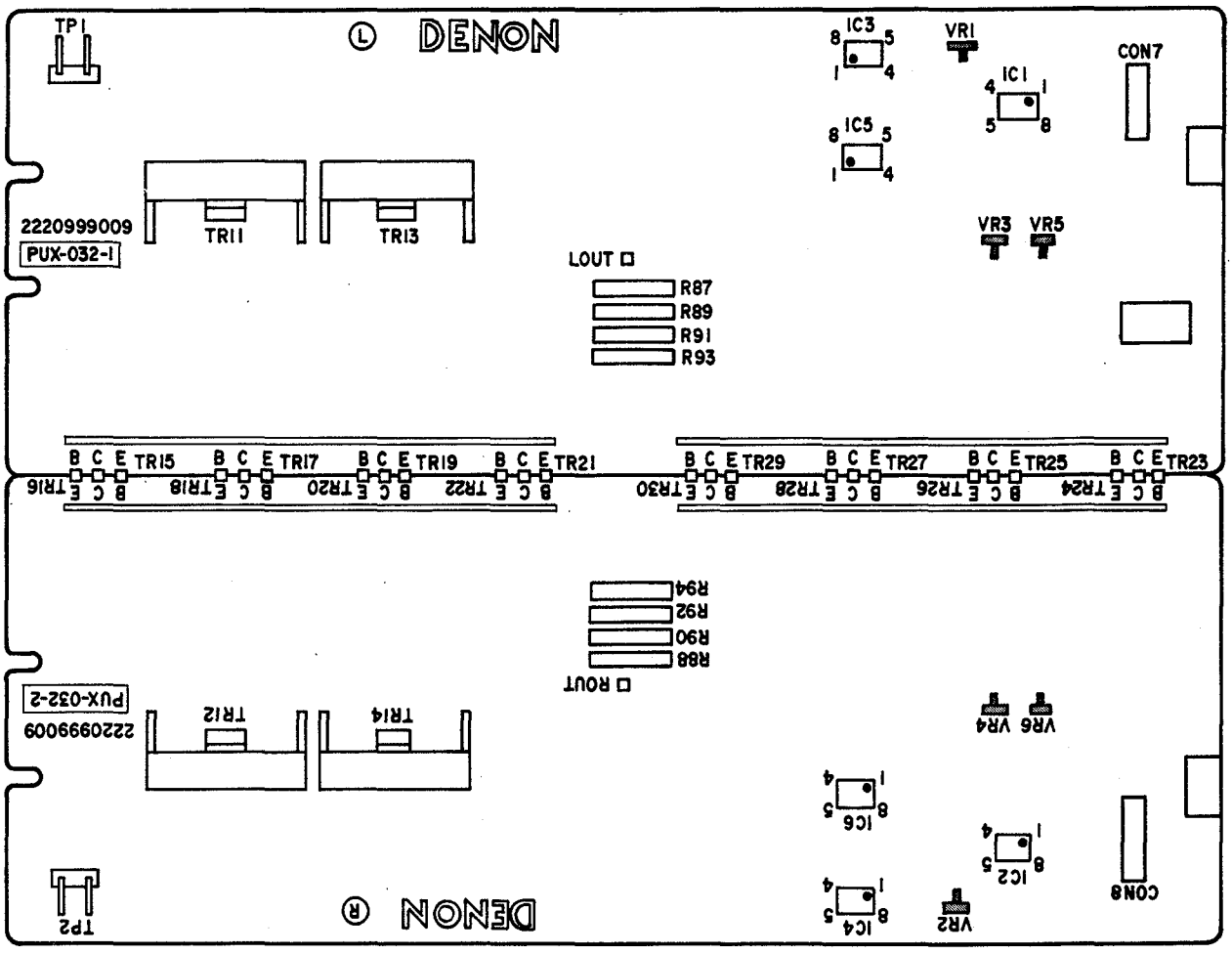
Fig. 9

(1) Set a oscillator output to "NORMAL" and feed it to both channels simultaneously.

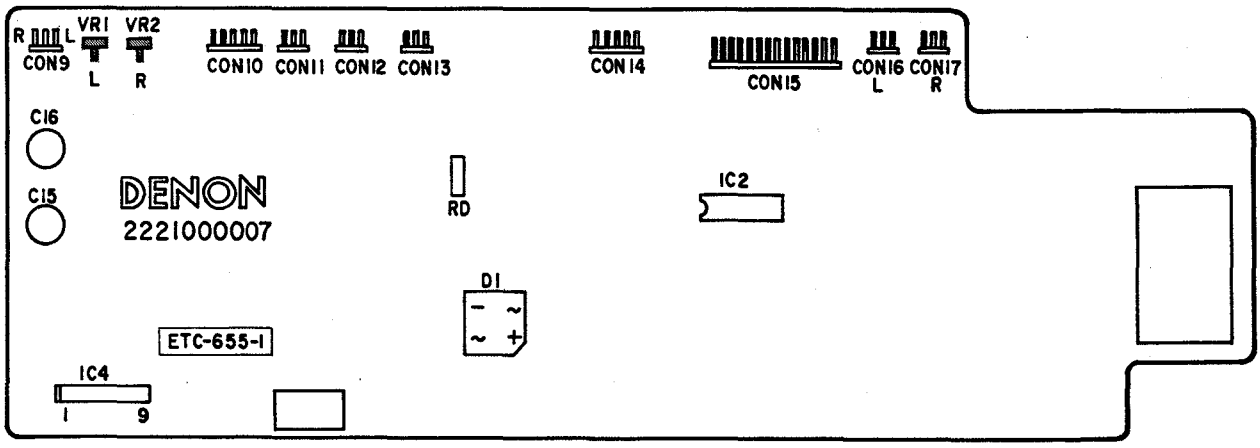
Esch speaker output to connect
- 8 ohm dummy resistor
- Distortion meter
- V.T.V.M.

(2) Turn the unit power on, and set the LEFT LEVEL and RIGHT LEVEL controls to -6dB.
(3) In the first place confirm that there's no dropping of supply voltage, then set the oscillator frequency to 1kHz and adjust output of oscillator to obtain 31.6V for both speaker outputs.
(4) Adjust VR5: Lch (VR6: R ch) on the PUX0032B for minimum distortion. Distortion factor must be no more than 0.01% at this time.
(5) Set the oscillator frequency to 20kHz and adjust output of oscillator to obtain 31.6V for both speaker outputs.
(6) Adjust VR3: Lch (VR4: R ch) for minimum distortion. Distortion factor must be no more than 0.015% at this time.

ALIGNMENT POINTS (Component Side)
PUX032B P. OUTPUT UNIT



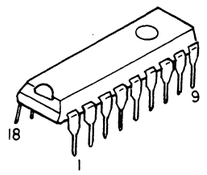
ETC0655B-1 METER & ETC UNIT

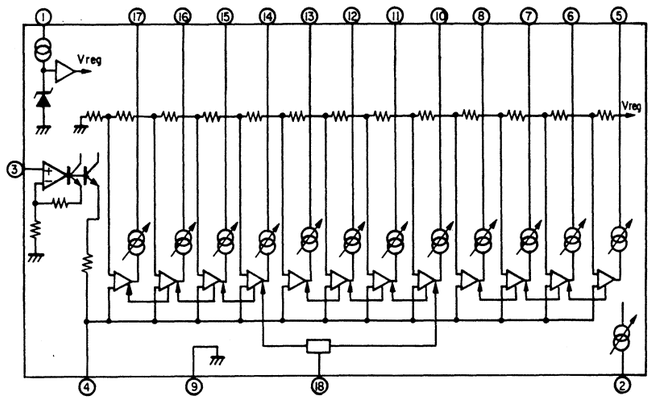


SEMICONDUCTORS

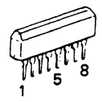
• IC's

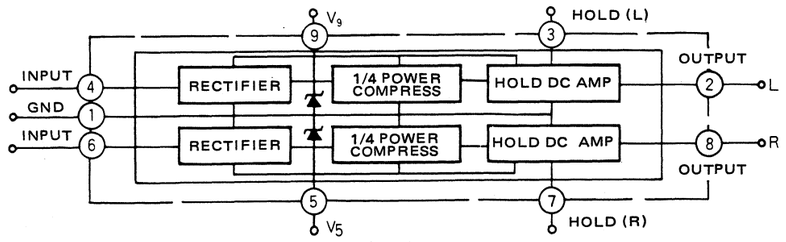
BA689 (Rohm)



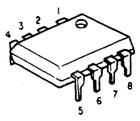


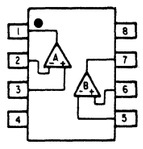
TA7318P(B/C)
(Toshiba)



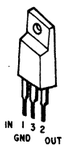


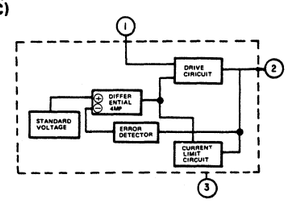
NJM082D
(JRC)



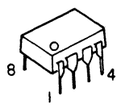


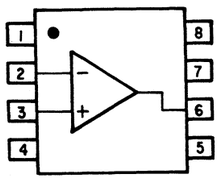
NJM7824A (JRC)
NJM78U2A (JRC)





NJM5534D
(JRC)

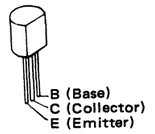




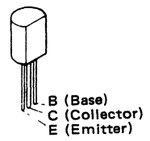
1. Balance
2. −Input
3. +Input
4. V^-
5. Compensation
6. Output
7. V^+
8. Balance/Compensation

• TRANSISTORS (include FET)

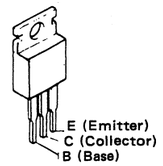
2SC1815(BL),(Y)
2SA1015(Y)



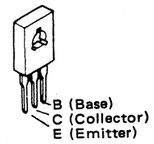
2SC2236(Y)
2SC2705(O/Y)



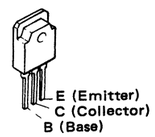
2SC2238(Y)
2SA968(Y)



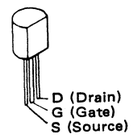
2SC2071(B),B/V
2SA939(B),B/V
2SC2682(Q)/(P)
2SA1142(Q)/(P)



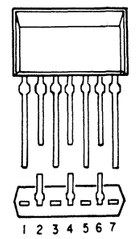
2SA1006A(Q)/(P)
2SC2336A(Q)/(P)



FET
2SK373(Y)

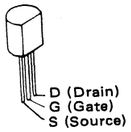


FET
2SK389(BL)/(V)



1. Drain 1
2. Gate 1
3. Source 1
4. Substrate
5. Source 2
6. Gate 2
7. Drain 2

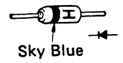
FET
2SK381(C)/(D)



• DIODES (include LED, Thermistor, Posistors)

HZ5C-1
HZ-15
HZ12A-2
HZ24-2
HZ-27-1

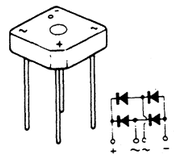
1S2076



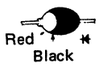
S2K40F

ID2C-1

S4VB20F



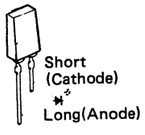
KB-265



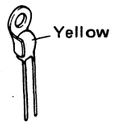
S10VB20F9

STV-1H

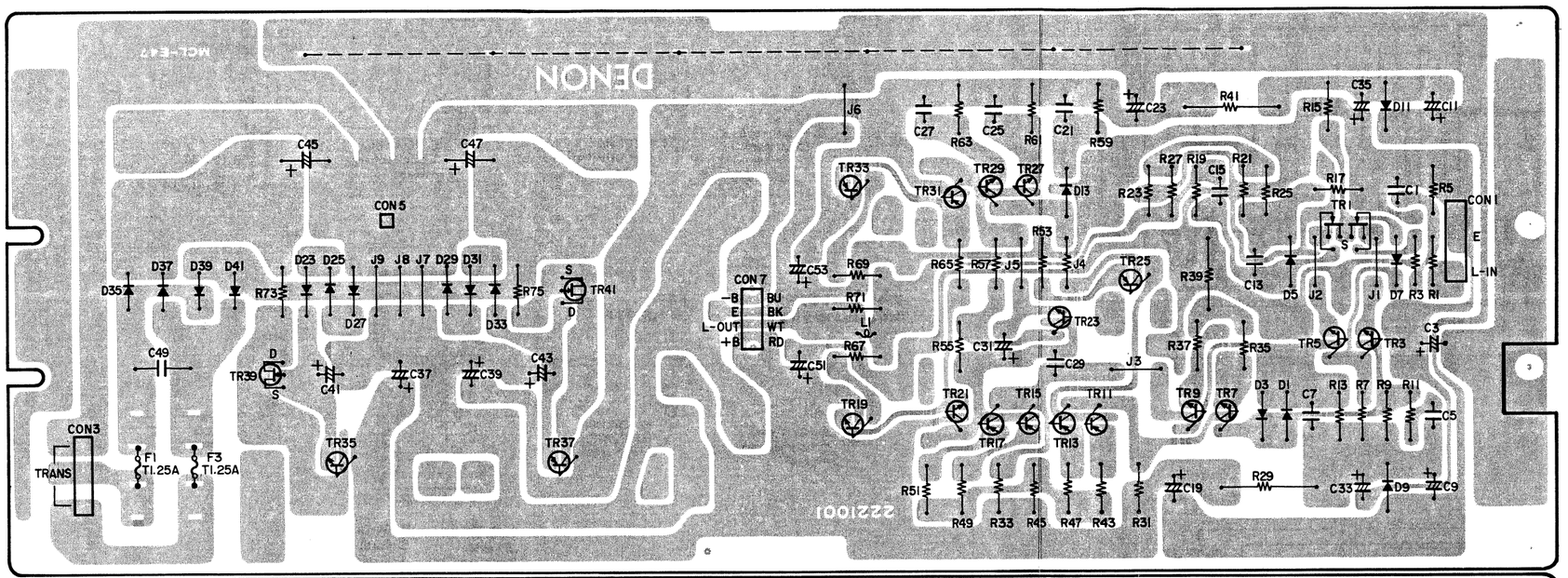
BG5541K . . . Green
AA-5541K . . . Orange

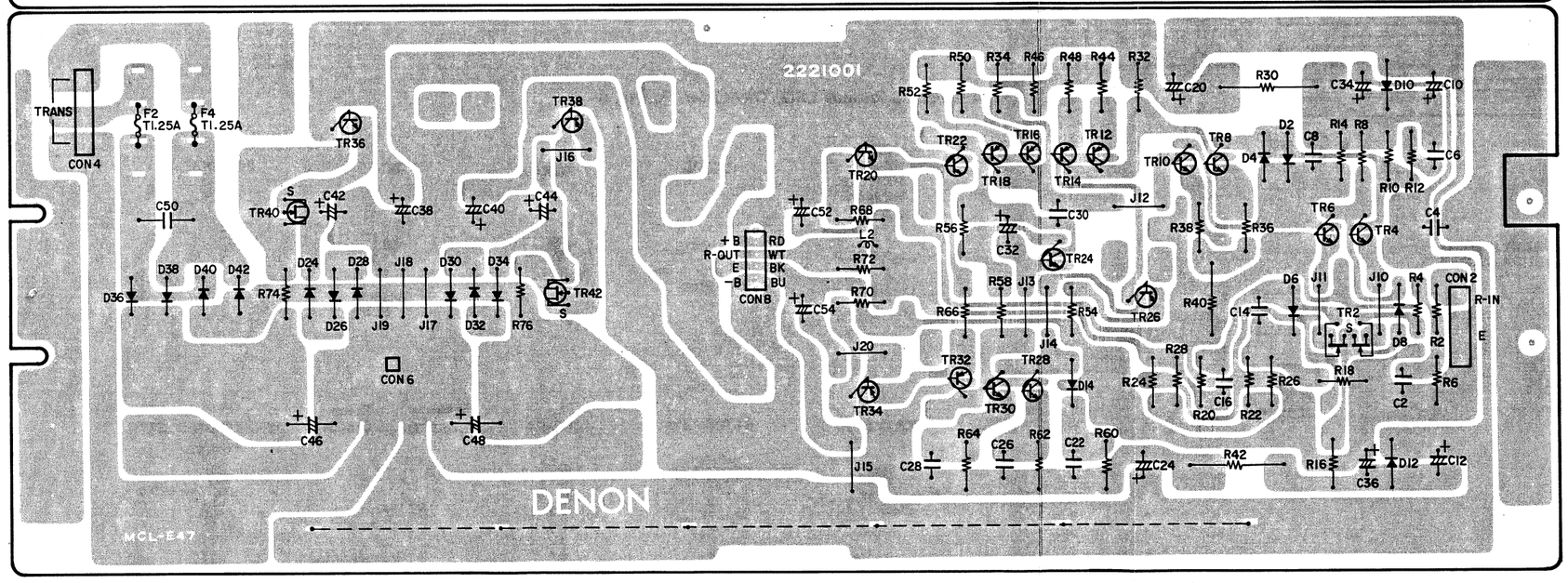


PTH487A01BD222TS
Posistor



PRINTED WIRING BOARD PATTERNS AND PARTS LIST
ETC0656B P. DRIVE UNIT





ETC0656B P. DRIVER UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
TR001, 002	2750045009	2SK389(BL)/(V)	FET
TR003 ~006	2730198015	2SC1815(BL)	TRANSISTOR
TR007 ~010	2730281003	2SC2705(O/Y)	TRANSISTOR
TR011 ~018	2710180001	2SA939B/V	TRANSISTOR
TR019, 020	2730199001	2SC2238(Y)	TRANSISTOR
TR021, 022	2730295002	2SC2071B/V	TRANSISTOR
TR023, 024	2730198015	2SC1815(BL)	TRANSISTOR
TR025, 026	2710104003	2SA968(Y)	TRANSISTOR
TR027 ~030	2730295002	2SC2071B/V	TRANSISTOR
TR031, 032	2710180001	2SA939B/V	TRANSISTOR
TR033, 034	2710104003	2SA968(Y)	TRANSISTOR
TR035, 036	2730199001	2SC2238(Y)	TRANSISTOR
TR037, 038	2710104003	2SA968(Y)	TRANSISTOR
TR039 ~042	2750042002	2SK373(Y)	FET
D001 ~006	2760049008	1S2076	DIODE
D007, 008	2760236031	HZ5C-1	ZENER
D009 ~012	2760220021	HZ24-2	ZENER
D013, 014	2760049008	1S2076	DIODE
D023 ~042	2760314021	HZ-27-1	ZENER
D043, 044	2760049008	1S2076	DIODE
RESISTORS (not included Carbon Film ±5%, 1/4W Type)			
R009, 010	2410193000	2.2 kohm ±5% 1/2W	CARBON
R013, 014	2410193000	2.2 kohm ±5% 1/2W	CARBON
ΔR015, 016	2440047029	3.3 kohm ±5% 1W	METAL OXIDE (NB)
ΔR029, 030	2440105026	3.9 kohm ±5% 2W	METAL OXIDE (NB)
ΔR031 ~034	2412321045	220 ohm ±5% 1/4W	CARBON (NB)
ΔR039, 040	2442013048	750 ohm ±5% 1W	METAL OXIDE (NB)
ΔR041, 042	2440105026	3.9 kohm ±5% 2W	METAL OXIDE (NB)

Ref. No.	Part No.	Part Name & Descriptions
⚠R043, 044	2412314049	10 ohm ±5% 1/4W CARBON (NB)
⚠R045, 046	2412314052	82 ohm ±5% 1/4W CARBON (NB)
⚠R047 ~052	2412314049	10 ohm ±5% 1/4W CARBON (NB)
⚠R053, 054	2440017020	10 ohm ±5% 1W METAL OXIDE (NB)
⚠R059, 060	2412321074	150 ohm ±5% 1/4W CARBON (NB)
⚠R061 ~064	2412314078	300 ohm ±5% 1/4W CARBON (NB)
⚠R065, 066	2412314023	470 ohm ±5% 1/4W CARBON (NB)
⚠R067 ~070	2440017020	10 ohm ±5% 1W METAL OXIDE (NB)
⚠R073 ~076	2440013024	4.7 ohm ±5% 1W METAL OXIDE (NB)
	CAPACITORS	
C001, 002	2554131009	270pF ±5% 50V PLASTIC FILM
C003, 004	2544044009	1μF 50V ELECTROLYTIC
C005, 006	2554145008	0.001μF ±5% 50V PLASTIC FILM
C007, 008	2554137003	470pF ±5% 50V PLASTIC FILM
C009 ~012	2544050006	100μF 50V ELECTROLYTIC
C013, 014	2543016083	22μF ±20% 50V ELECTROLYTIC (BP)
C015, 016	2521005003	5pF ±0.5pF 50V MICA
C019, 020	2544060025	1μF 100V ELECTROLYTIC
C021, 022	2554145008	0.001μF ±5% 50V PLASTIC FILM
C023, 024	2544060025	1μF 100V ELECTROLYTIC
C025 ~028	2554131009	270pF ±5% 50V PLASTIC FILM
C029, 030	2521081043	10pF ±0.5pF 500V MICA
C031, 032	2544060009	10μF 100V ELECTROLYTIC
C033 ~036	2544044009	1μF 10V ELECTROLYTIC
C041 ~044	2544060009	10μF 100V ELECTROLYTIC
C045 ~048	2546057007	470μF ±20% 160V ELECTROLYTIC
C049, 050	2561016007	0.068μF ±10% 400V METALIZED
C051 ~054	2544060025	1μF 100V ELECTROLYTIC
C237 ~240	2544060009	10μF 100V ELECTROLYTIC

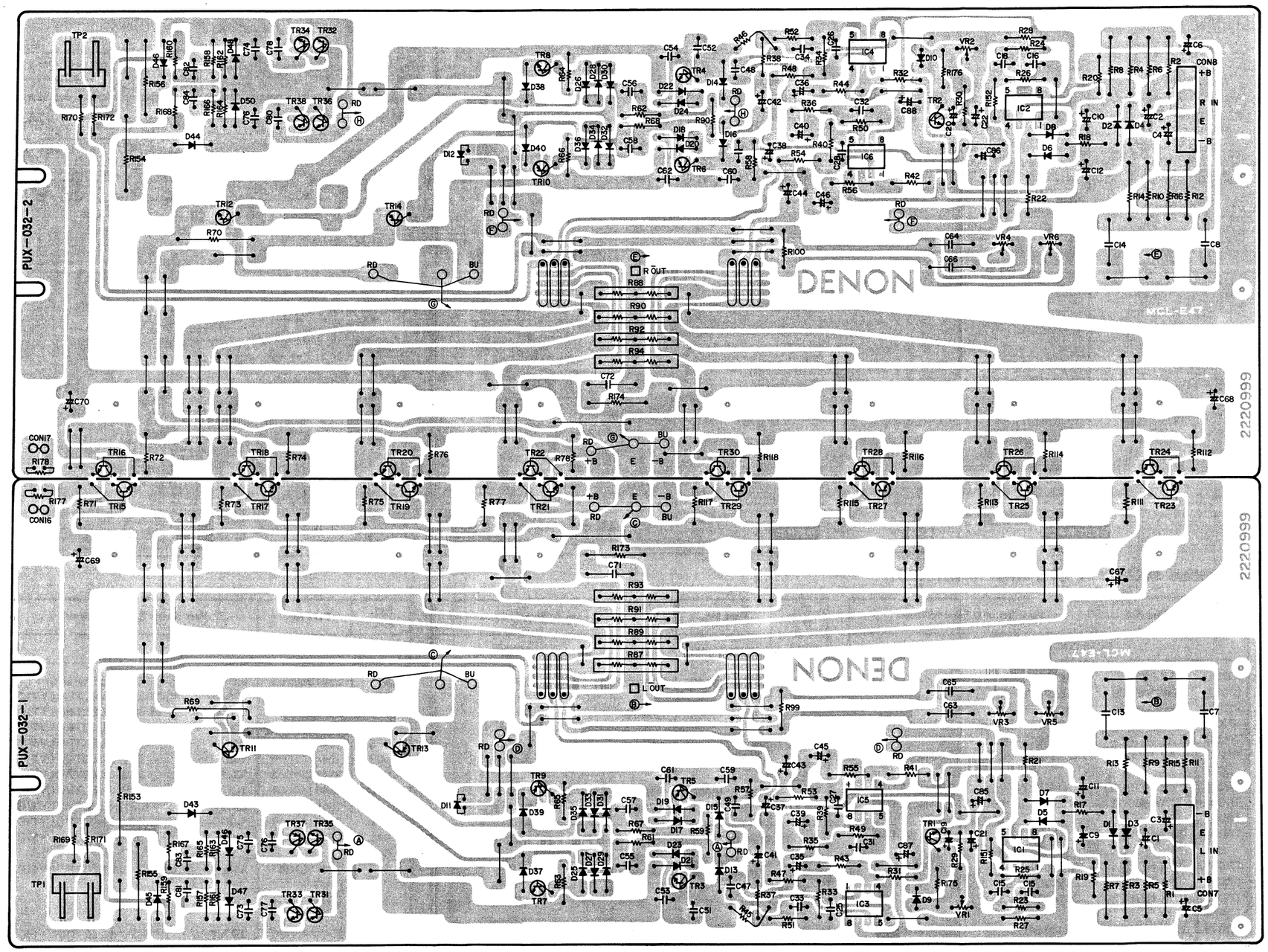
Ref. No.	Part No.	Part Name & Descriptions
	OTHER PARTS	
	2221001006	P.W. BOARD
	EP-5667H1	TERMINAL PIN USED 4
	2090008120	JUMPER WIRE P=10mm USED 18
	2090051009	0 ohm JUMPER TAPE USED 2
	2050141001	COMMON PLATE USED 2
	2020014003	FUSE CLIP USED 8
F001 ~004	2061035025	FUSE (1.25A) USED 4
	4140240001	EARTH PLATE USED 2
	2050122033	3P CONNECTOR PIN ASS'Y USED 4
	2050185041	4P WIRE HOLDER USED 2
	EP-6071	BASE PIN USED 2
	4170043100	RADIATOR USED 6
	4730354019	TAPPING SCREW (2) 3x8 USED 6
	4170221003	RADIATOR USED 4
	4700012022	PAN SCREW WITH W.SW 3x12 USED 4
L001, 002	2350008006	INDUCTOR 22mH
CON-7, -8	2036099025	4P CONNECTOR CORD USED 2

PUX0032B P. OUTPUT UNIT PARTS LIST

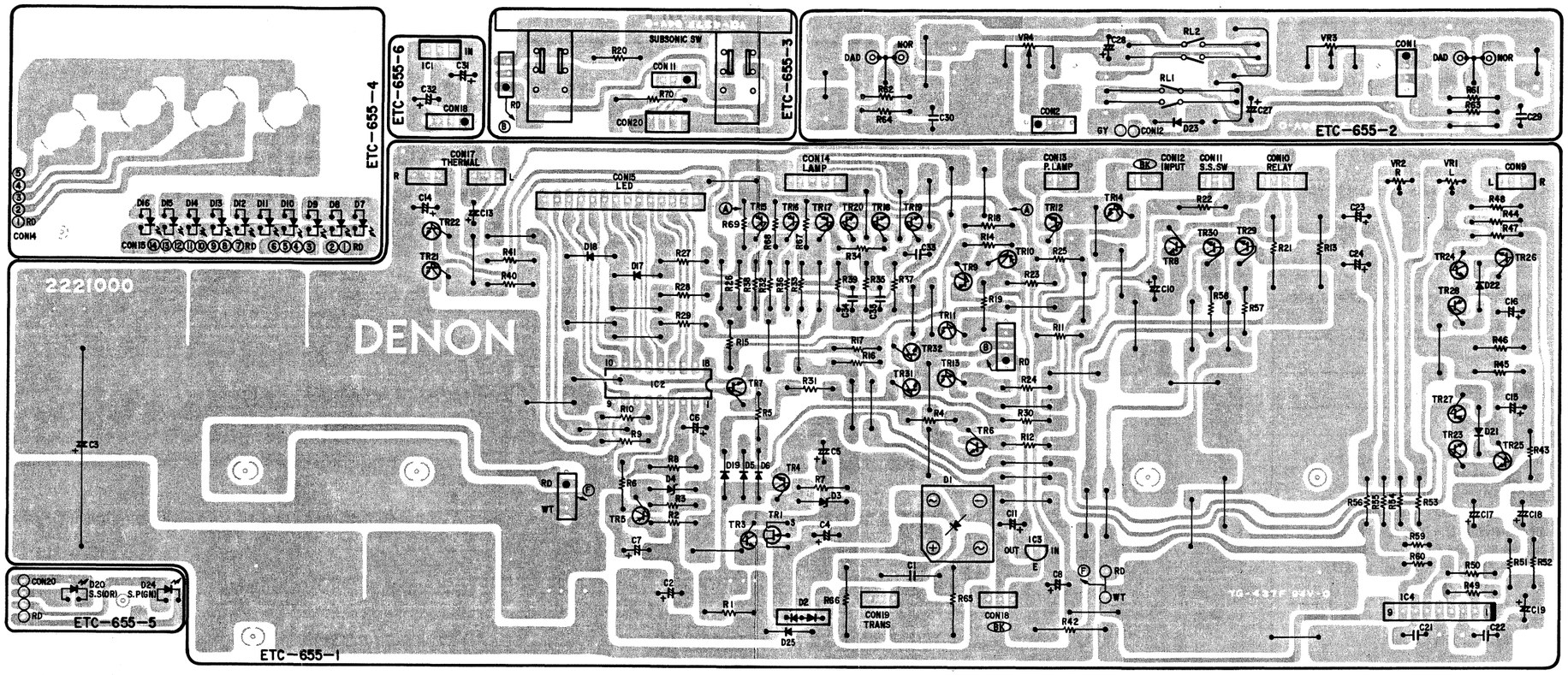
Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
IC001, 002	2630244001	NJM082D JRC IC
IC003 ~006	2650055005	NJM-5534D JRC IC
TR001, 002	2730198015	2SC1815(BL) TRANSISTOR
TR003, 004	2730290007	2SC2682(O)/(P) TRANSISTOR
TR005, 006	2710175003	2SA1142(O)/(P) TRANSISTOR
TR007, 008	2730256009	2SC2071(B) TRANSISTOR
TR009, 010	2710148001	2SA939(B) TRANSISTOR
TR011, 012	2730291006	2SC2336A(O)/(P) TRANSISTOR
TR013, 014	2710176002	2SA1006A(O)/(P) TRANSISTOR
TR031, 032	2710102005	2SA1015(Y) TRANSISTOR
TR033 ~036	2730198015	2SC1815(BL) TRANSISTOR
TR037, 038	2710102005	2SA1015(Y) TRANSISTOR
D001 ~004	2760219003	HZ-15 ZENER
D005 ~008	2760049008	1S2076 DIODE
D009, 010	2760334001	STV-1H DIODE
D011, 012	2760216019	KB-265 DIODE
D013 ~040	2760049008	1S2076 DIODE
D043 ~050	2760049008	1S2076 DIODE
RESISTORS (not included Carbon Film ±5%, 1/4W Type)		
⚠ R001 ~016	2440046020	2.7 kohm ±5% 1W METAL OXIDE (NB)
⚠ R017, 018	2412321003	1 kohm ±5% 1/4W CARBON (NB)
⚠ R021, 022	2412321003	1 kohm ±5% 1/4W CARBON (NB)
⚠ R023 ~028	2412369078	4.7 kohm ±5% 1/4W CARBON (NB)
⚠ R045, 046	2412321003	1 kohm ±5% 1/4W CARBON (NB)
⚠ R057, 058	2412321003	1 kohm ±5% 1/4W CARBON (NB)
⚠ R059, 060	2412369081	330 ohm ±5% 1/4W CARBON (NB)
⚠ R061, 062	2412314007	100 ohm ±5% 1/4W CARBON (NB)
⚠ R067, 068	2412314007	100 ohm ±5% 1/4W CARBON (NB)
⚠ R069, 070	2440084011	68 ohm ±5% 2W METAL OXIDE (NB)
⚠ R071 ~078	2412321032	4.7 ohm ±5% 1/4W CARBON (NB)
R079 ~086	2462020008	1/6W R. ARRAY
R087 ~094	2432033038	0.18/0.18 ohm 2W WIRE WOUND
R095 ~098	2462020008	1/6W R. ARRAY
⚠ R099, 100	2412321016	22 ohm ±5% 1/4W CARBON (NB)
⚠ R111 ~118	2412321032	4.7 ohm ±5% 1/4W CARBON (NB)
⚠ R151, 152	2412369078	4.7 kohm ±5% 1/4W CARBON (NB)
⚠ R153 ~156	2440098023	1 kohm ±5% 2W METAL OXIDE (NB)
⚠ R157 ~160	2412314052	82 ohm ±5% 1/4W CARBON (NB)
⚠ R161 ~164	2412369081	330 ohm ±5% 1/4W CARBON (NB)
⚠ R165 ~168	2412314052	82 ohm ±5% 1/4W CARBON (NB)
⚠ R173, 174	2440021016	22 ohm ±5% 1W METAL OXIDE (NB)
R175, 176	2760289004	PTH487A01BD222TS POSISTOR
VR001, 002	2116014072	SEMI FIXED RESISTOR 10 kohm
VR003 ~006	2116014001	SEMI FIXED RESISTOR 100 ohm
CAPACITORS		
C001 ~004	2544060025	1μF 100V ELECTROLYTIC
C005, 006	2544044009	1μF 50V ELECTROLYTIC
C007, 008	2561016007	0.068μF ±10% 400V METALIZED
C009 ~012	2544059023	47μF 63V ELECTROLYTIC
C013, 014	2561016007	0.068μF ±10% 400V METALIZED
C015 ~018	2521079039	47pF ±10% 500V MICA
C019, 020	2544044009	1μF 50V ELECTROLTYIC
C021, 022	2544060025	1μF 100V ELECTROLYTIC
C025 ~028	2521003005	3pF ±0.25pF 50V MICA
C031 ~034	2521061005	33pF ±10% 50V MICA
C035 ~038	2544060025	1μF 100V ELECTROLYTIC
C039 ~042	2544060009	10μF 100V ELECTROLYTIC
C043 ~046	2544060025	1μF 100V ELECTROLYTIC
C047 ~050	2554121006	100pF ±5% 50V PLASTIC FILM
C051, 052	2521079071	22pF ±10% 500V MICA
C053, 054	2554137003	470pF ±5% 50V PLASTIC FILM
C055 ~058	2554149004	0.0015μF ±5% 50V PLASTIC FILM
C059, 060	2521079071	22pF ±10% 500V MICA

PUX0032B P. OUTPUT UNIT

Ref. No.	Part No.	Part Name & Descriptions
C061, 062	2554137003	470pF ±5% 50V PLASTIC FILM
C063 ~066	2551134038	0.022μF ±5% 50V PLASTIC FILM
C067 ~070	2544060025	1μF 100V ELECTROLYTIC
C071, 072	2561017019	0.01μF ±10% 630V METALIZED
C073 ~076	2554161008	0.0047μF ±5% 50V PLASTIC FILM
C077 ~080	2551135082	0.027μF ±5% 50V PLASTIC FILM
C081 ~084	2551134025	0.01μF ±5% 50V PLASTIC FILM
C085 ~088	2544044009	1μF 50V ELECTROLYTIC
		OTHER PARTS
	2220999009	P.W. BOARD
	EP-5667H1	TERMINAL PIN USED 6
	2090008120	JUMPER WIRE P=10mm USED 120
	2050075025	2P TERMINAL USED 2
	4140240001	EARTH PLATE USED 2
	2050141001	COMMON PLATE USED 4
	2050122046	4P CONNECTOR PIN ASS'Y USED 2
	2090008146	JUMPER WIRE P=5mm USED 4
	2090008162	JUMPER WIRE P=20mm USED 2
	4170221003	RADIATOR USED 4
	4700012022	PAN SCREW WITH W.SW 3x12 USED 4
CON-16	2034185054	3P CONNECTOR CORD
CON-17	2034185067	3P CONNECTOR CORD



ETC0655B METER & ETC UNIT



ETC0655B METER & ETC UNIT PART LIST

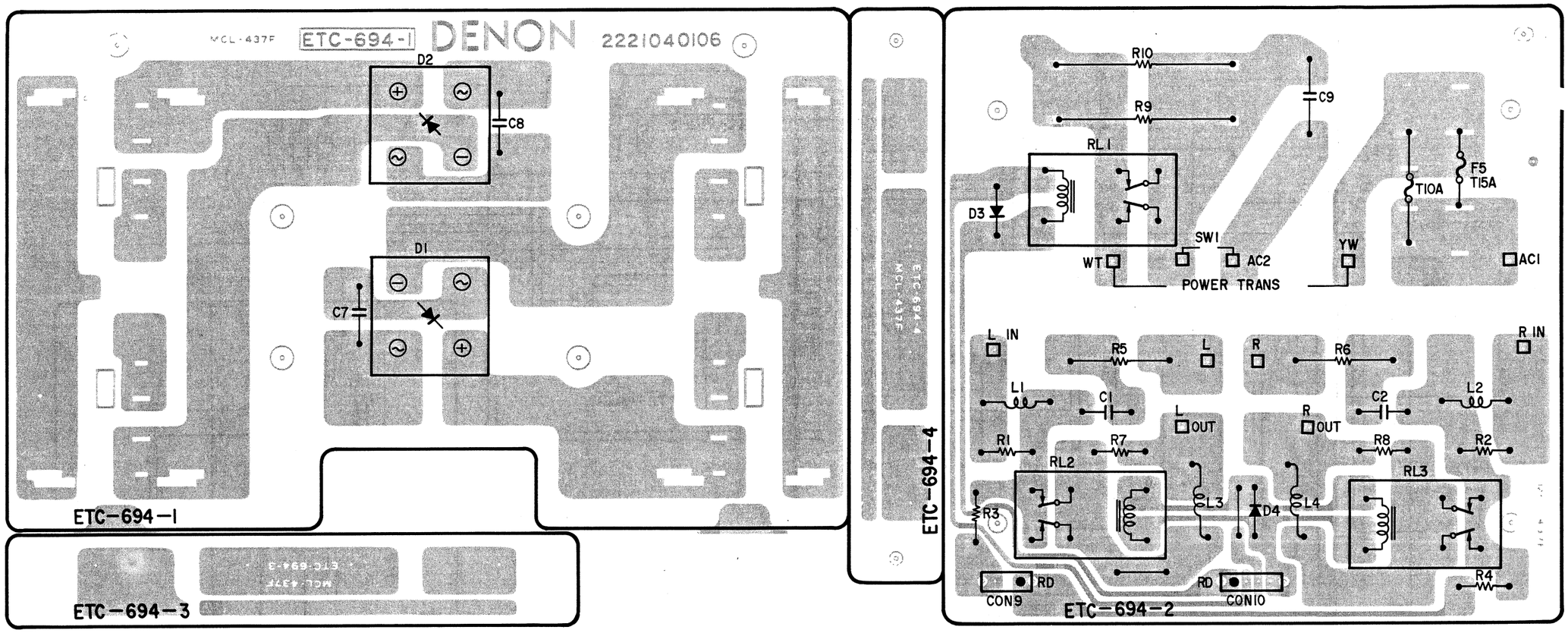
Ref. No.	Part No.	Part Name & Descriptions	
		SEMICONDUCTORS	
IC001	2630306004	NJM7824A JRC	IC
IC002	2620529008	BA-689 SANYO	IC
IC003	2630305005	NJM78L12A JRC	IC
IC004	2630071009	TA-7318P TOSHIBA	IC
TR001	2750043014	2SK381(C)/(D)	FET
TR003, 004	2730198002	2SC1815(Y)	TRANSISTOR
TR005	2710102005	2SA1015(Y)	TRANSISTOR
TR006 ~008	2730198002	2SC1815(Y)	TRANSISTOR
TR009, 010	2710102005	2SA1015(Y)	TRANSISTOR
TR011	2710102005	2SA1015(Y)	TRANSISTOR
TR012	2730201009	2SC2236(Y)	TRANSISTOR
TR013, 014	2730198002	2SC1815(Y)	TRANSISTOR
TR015 ~017	2710102005	2SA1015(Y)	TRANSISTOR
TR018 ~026	2730198002	2SC1815(Y)	TRANSISTOR
TR027, 028	2710102005	2SA1015(Y)	TRANSISTOR
TR029 ~032	2730198002	2SC1815(Y)	TRANSISTOR
TR033	2750043014	2SK381(C)/(D)	FET
D001	2760338007	S4VB20F	DIODE
D002	2760152005	1D2Z-1	DIODE
D003	2760318001	HZ12A-2	ZENER
D004	2760236031	HZ5C-1	ZENER

Ref. No.	Part No.	Part Name & Descriptions	
D005, 006	2760049008	1S2076	DIODE
D007 ~016	3939248008	BG5541K GREEN	LED
D017 ~019	2760049008	1S2076	DIODE
D020	3939246000	AA-5541K	LED
D021, 022	2760049008	1S2076	DIODE
D024	3939248008	BG5541K GREEN	LED
D025	2760237001	RV06	DIODE
		RESISTORS (not included Carbon Film ±5%, 1/4W Type)	
△R013	2440032021	180 ohm ±5% 1W	METAL OXIDE (NB)
△R021	2440027023	68 ohm ±5% 1W	METAL OXIDE (NB)
△R042	2440040026	820 ohm ±5% 1W	METAL OXIDE (NB)
R059, 060	2790006011	112101-2	THERMISTOR
△R065	2442013080	0.22 ohm ±5% 1W	METAL OXIDE (NB)
△R070	2440045021	2.2 kohm ±5% 1W	METAL OXIDE (NB)
VR001, 002	2116014056	SEMI FIXED RESISTOR 2 kohm	
VR003, 004	2110228107	VARIABLE RESISTOR 100 kohm R, L LEVEL	

Ref. No.	Part No.	Part Name & Descriptions
		CAPACITORS
C001	2531053003	0.01μF +100,–0% 500V CERAMIC
C002	2544165001	220μF ±20% 35V ELECTROLYTIC
C003	2542077007	3300μF ±20% 35V ELECTROLYTIC
C004	2544141009	10μF 35V ELECTROLYTIC
C005	2544146004	1μF 50V ELECTROLYTIC
C006	2544132005	10μF 16V ELECTROLYTIC
C007	2544134003	33μF 16V ELECTROLYTIC
C008	2544146004	1μF 50V ELECTROLYTIC
C010	2544127007	220μF 6.3V ELECTROLYTIC
C011	2544146004	1μF 50V ELECTROLYTIC
C013, 014	2544129005	47μF 10V ELECTROLYTIC
C015, 016	2544161047	470μF ±20% 6.3V ELECTROLYTIC
C017, 018	2544146004	1μF
C019	2544145005	0.47μF 6.3V ELECTROLYTIC
C021, 022	2551121067	0.022μF ±5% 6.3V PLASTIC FILM
C023, 024	2544128006	22μF 10V ELECTROLYTIC
C027, 028	2544145005	0.47μF 50V ELECTROLYTIC
C029, 030	2554131009	270pF ±5% 50V PLASTIC FILM
C031, 032	2544146004	1μF 50V ELECTROLYTIC
C033 ~035	2531024003	0.01μF +80,–20% 50V CERAMIC

Ref. No.	Part No.	Part Name & Descriptions
C037	2544130007	100μF 10V ELECTROLYTIC
C038	2544140000	4.7μF 35V ELECTROLYTIC
		OTHER PARTS
	2221000007	P.W. BOARD
	EP-5667H1	TERMINAL PIN USED 4
	2090008120	JUMPER P=10mm USED 40
	2050184000	2P CONNECTOR BASE INPUT
	2090008146	JUMPER P=5mm USED 2
	2090008104	JUMPER P=15mm USED 1
SW002	2124449008	2P PUSH SWITCH
RL001, 002	2140020003	REED RELAY L23(M)
PL001 ~004	3930075005	P. LAMP 28V 0.04A
	2050154030	3P NH CONNECTOR BASE USED 8
	2050154043	4P NH CONNECTOR BASE
	2050154056	5P NH CONNECTOR BASE
	2050182044	14P NH CONNECTOR BASE (H)
	2050190049	4P NH CONNECTOR BASE
	2050185038	3P WIRE HOLDER USED 7
	2032155002	CONTACT ASS'Y
CON-1, -2	2034218002	3P CONNECTOR CORD
CON-12	2034219001	3P CONNECTOR CORD
CON-11	2034203062	3P CONNECTOR CORD
CON-18	2034189076	3P CONNECTOR CORD
CON-20	2036105074	4P CONNECTOR CORD
CON-14	2038109081	5P CONNECTOR CORD
CON-15	2046025005	14P CONNECTOR CORD

ETC0694B P. SUPPLY & ETC UNIT



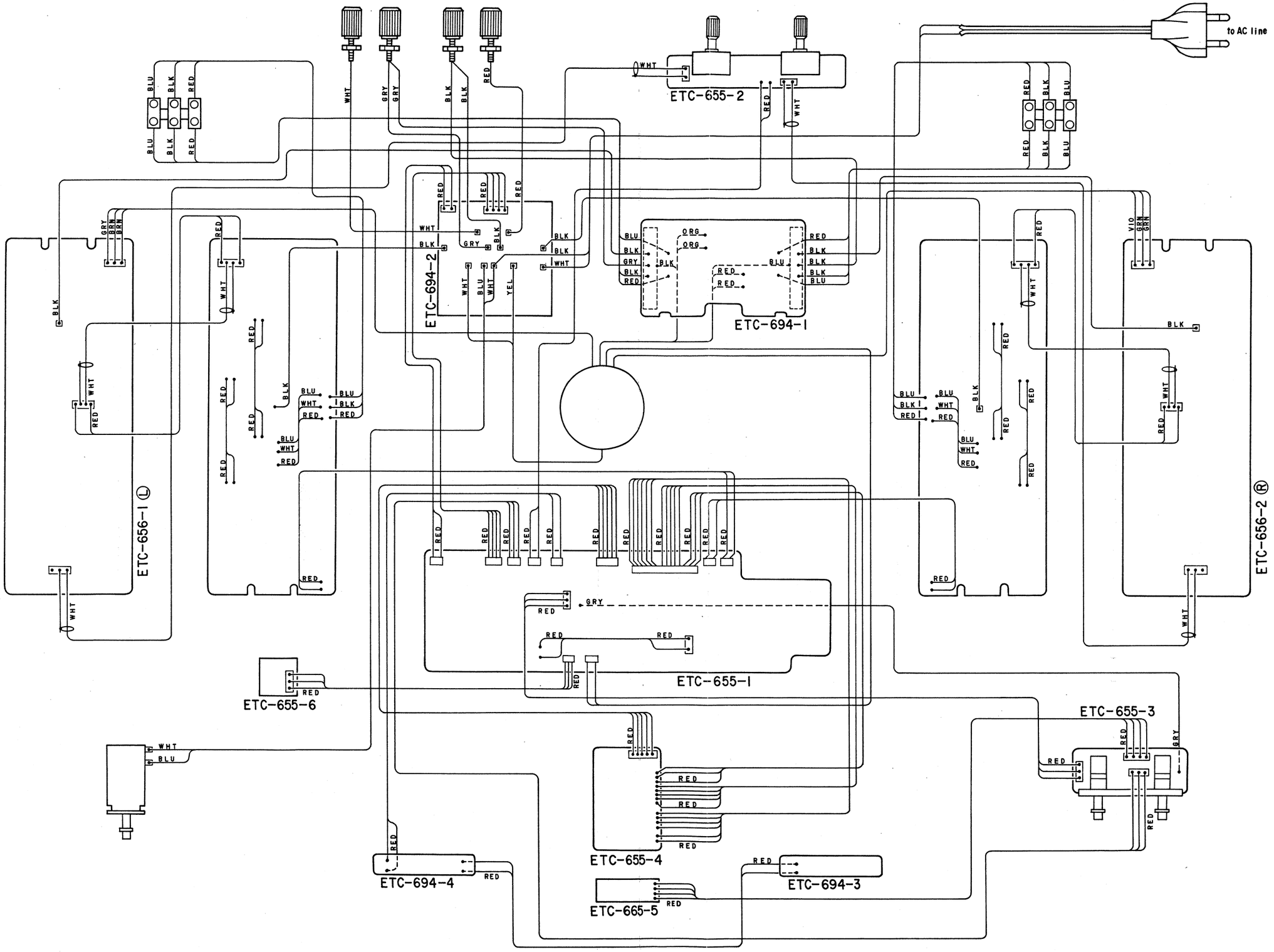
ETC0694B P. SUPPLY & ETC UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
⚠D001, 002	2760371006	S10VB20F9 DIODE
D003, 004	2760049008	1S2076 DIODE
		RESISTORS
⚠R001, 002	2440025025	47 ohm ±5% 1W METAL OXIDE (NB)
R003, 004	2412092002	1 kohm ±5% 1/4W CARBON
⚠R005, 006	2440078027	22 ohm ±5% 2W METAL OXIDE (NB)
⚠R007, 008	2440013024	4.7 ohm ±5% 1W METAL OXIDE (NB)
⚠R009, 010	2432044001	1.2 ohm ±10% 10W WIRE WOUND
⚠R072	2440009009	2.2 ohm ±5% 1W METAL OXIDE (NB)

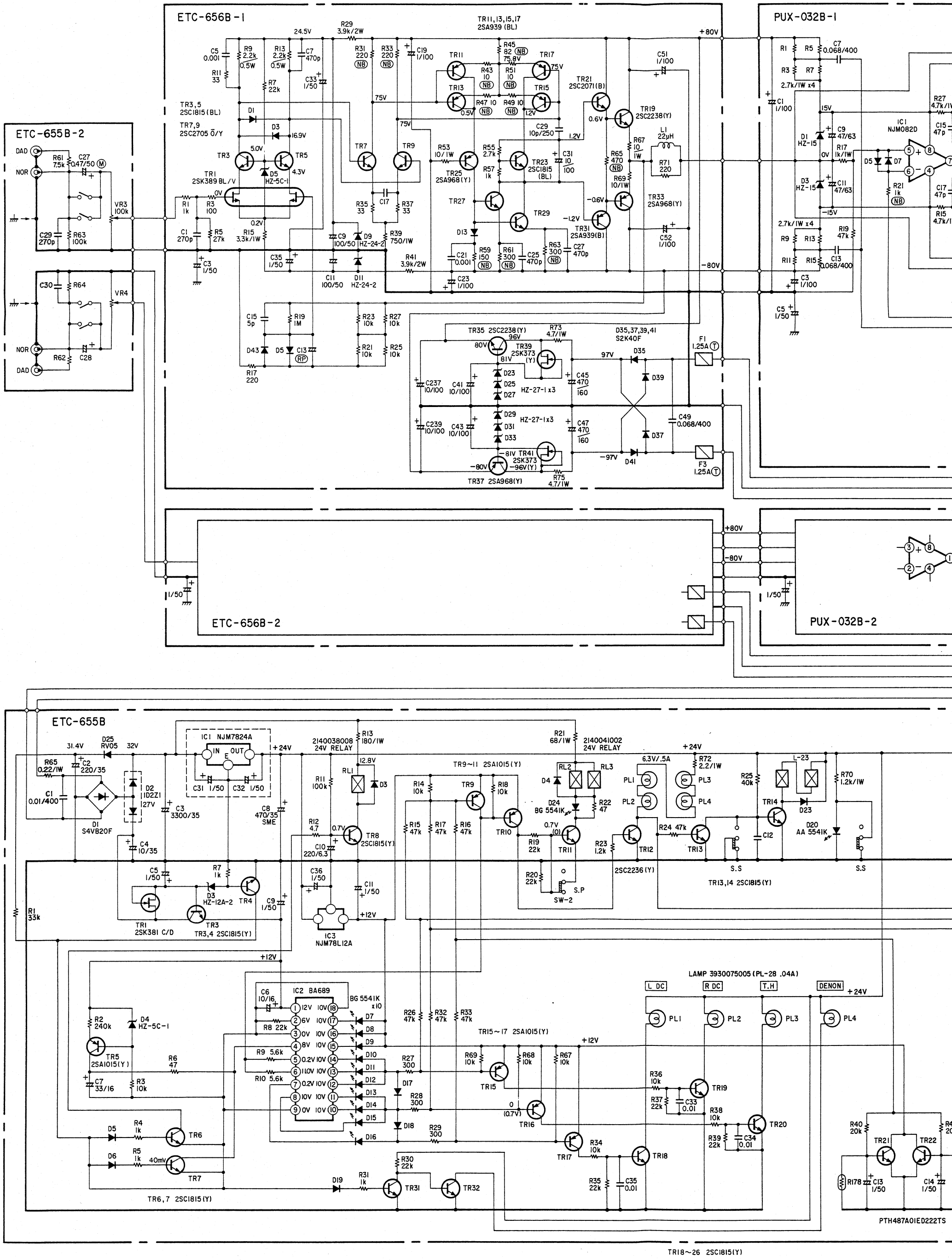
Ref. No.	Part No.	Parts Name & Descriptions
		CAPACITORS
C001, 002	2561017035	0.022μF ±10% 630V METALIZED
C007, 008	2561016007	0.068μF ±10% 400V METALIZED
C009	2558000042	0.01μF ±20% 160V PLASTIC FILM
		COILS
L001 ~004	2350007007	INDUCTOR
RL001	2140038008	RELAY
RL002, 003	2140041008	RELAY
		OTHER PARTS
	2221040106	P.W. BOARD
	EP-5667H1	TERMINAL PIN USED 14
	2090008120	JUMPER WIRE P=10mm USED 2

Ref. No.	Part No.	Parts Name & Descriptions
⚠F001 ~004	2061035096	FUSE (10.0A) USED 4
⚠F005	2061017030	FUSE (15A) USED 1
PL001 ~004	3930043008	PILOT LAMP USED 4
⚠	2020014003	FUSE CLIP USED 8
⚠	EP-5870	FUSE HOLDER USED 2
	2050185038	3P WIRE HOLDER
	2050185041	4P WIRE HOLDER
CON-9	2034185038	3P CONNECTOR CORD
CON-10	2036116018	4P CONNECTOR CORD
CON-13	2034185070	3P CONNECTOR CORD
CON-5, 6	2030195035	1P CONNECTOR CORD USED 2
	5130815021	FUSE LABEL USED 4

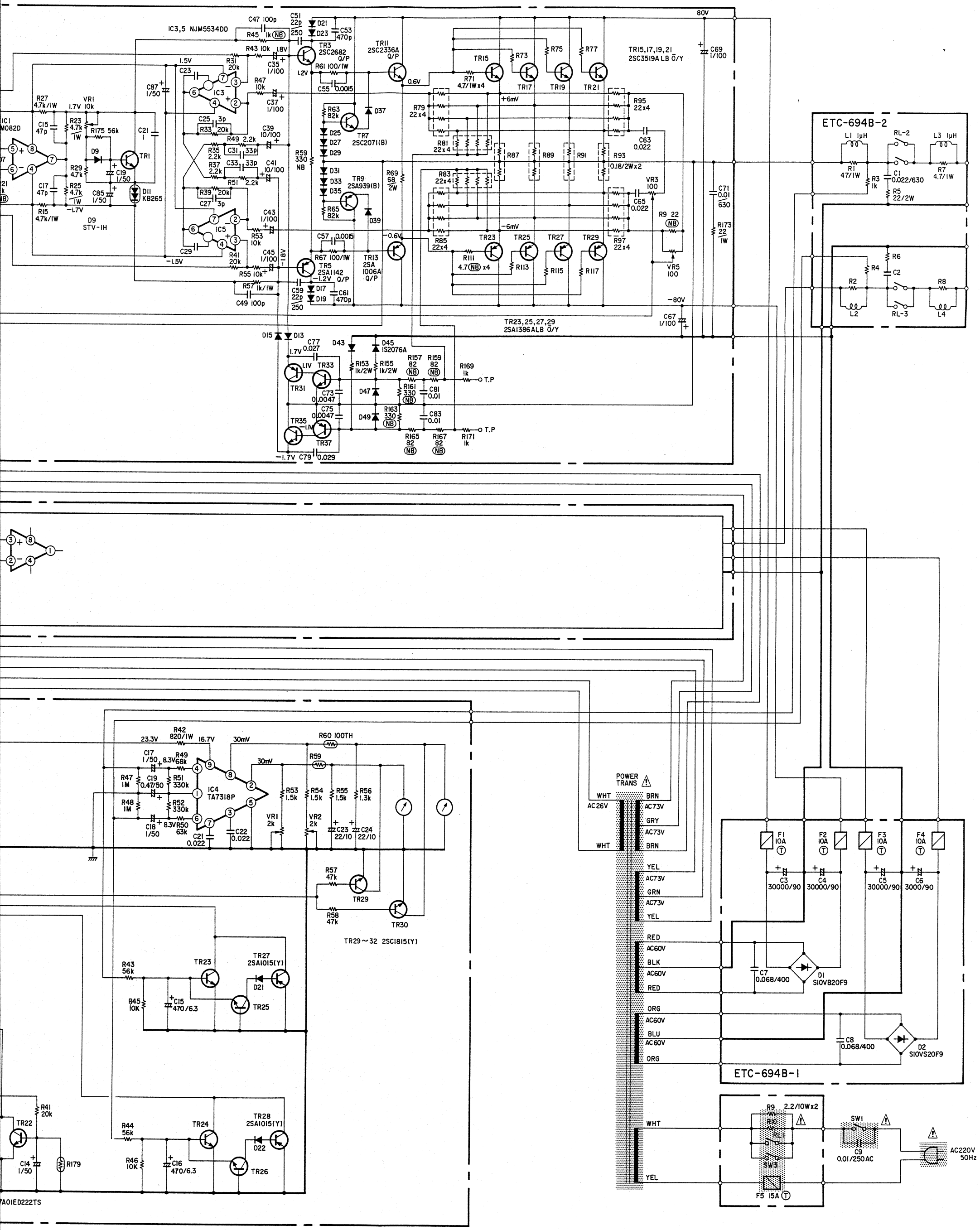
CONNECTION DIAGRAM



WIRING DIAGRAM

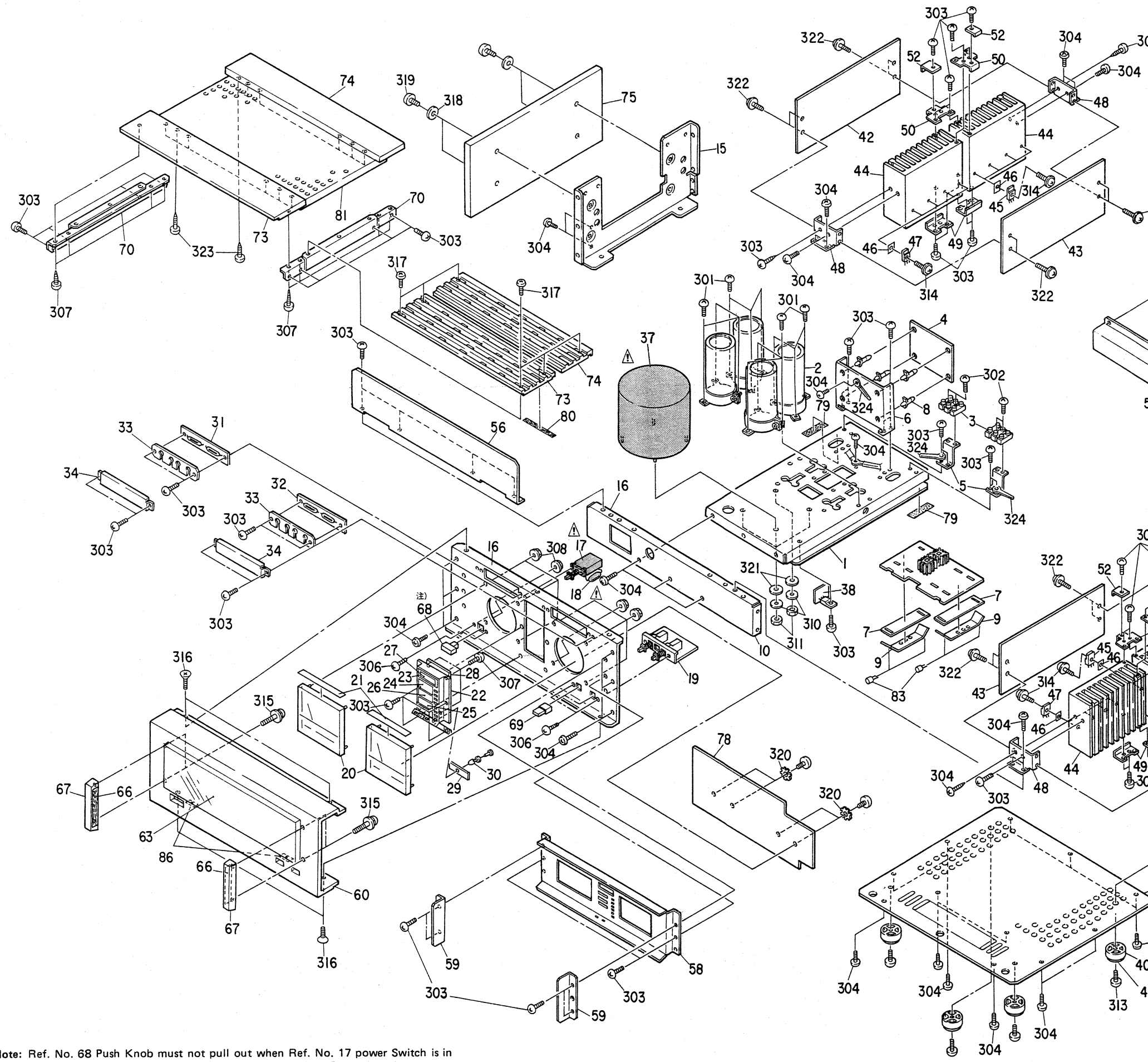


⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



NOTES
ALL RESISTANCE VALUES IN OHM K = 1,000 OHM M = 1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

EXPLODED VIEW OF CHASSIS AND CABINET
(This figure is the specifications on E2)



Note: Ref. No. 68 Push Knob must not pull out when Ref. No. 17 power Switch is in turned on mode, it should be pulled out after turn off the Power Switch.

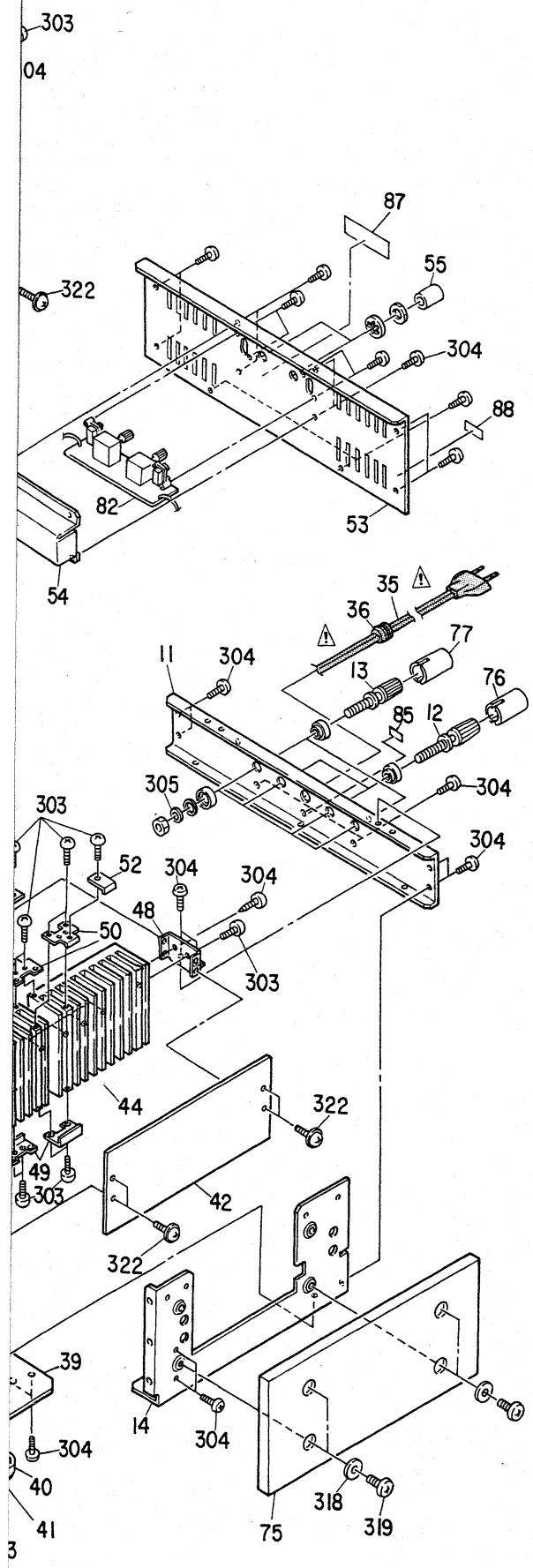
EXPLODED VIEW OF CHASSIS AND CABINET PARTS LIST NOTE: ★ Mark not included EXPLODED VIEW.

Ref. No.	Part No.	Part Name & Descriptions	Q'ty
1	4121566306	TRANS CHASSIS	1
2	2546082001	CHEMICON 30000μF/90V	4
3	2050086014	3P TERMINAL BLOCK	2
4	ETC0694B	P. SUPPLY & ETC UNIT	1s
5	4121568003	BRACKET (L)	2
6	4121567101	BRACKET (R)	1
7	4140347108	EARTH PLATE	2
8	4150228000	P.C.B. HOLDER	4
9	4140346109	EARTH PLATE	2
10	4110413101	CHASSIS FRAME	1
11	4121575012	BACK FRAME	1
12	2050115008	1P TERMINAL (BLACK)	2
13	2050115011	(RED)	2
14	4121564104	SIDE CHASSIS (R)	1
15	4121565006	SIDE CHASSIS (L)	1
16	4121563008	FRONT CHASSIS	1
⚠17	2124405013	POWER SWITCH	1
⚠18	2568023006	CAPACITOR 0.01μF/250VAC	1
19	ETC0655B-1	METER UNIT	1s
20	2150060105	METER ASS'Y	2
21	1430342010	FILTER	2
22	4410418107	LED HOLDER	1
23	1430321015	FILTER DENON	1
24	1430322069	FILTER	1
25	1430322043	FILTER	1

Ref. No.	Part No.	Part Name & Descriptions	Q'ty
26	1430322056	FILTER	1
27	1430245191	FILTER	1
28	ETC0655B-4	DISPLAY UNIT	1s
29	ETC0655B-5	LED UNIT	1s
30	4770210003	PUSH RIVET	1
31	ETC0694B-3	LAMP UNIT	1s
32	ETC0694B-4	LAMP UNIT	1s
33	4140348107	REFLECTOR	2
34	4140342103	REFLECTOR	2
⚠35	2062026101	AC CORD	1
⚠36	4450020005	CORD BUSH	1
⚠37	2334507002	POWER TRANS	1
38	ETC0655B-6	TR UNIT	1s
39	1050593100	BOTTOM COVER	1
40	1441164009	FOOT BASE	4
41	1240038019	FELT SHEET	4
42	ETC0656B	P. DRIVE UNIT	1s
43	PUX0032B	P. OUTPUT UNIT	1
44	4170220004	POWER RADIATOR	4
45	2710181000	TRANSISTOR 2SA1386ALB(O)/(Y)	8
46	4150234007	INSULATING SHEET	16
47	2730300007	TRANSISTOR 2SC3519ALB(O)/(Y)	8

Ref. No.	Part No.	Part Name & Descriptions	Q'ty
48	4121569109	RADIATOR BRACKET (A)	4
49	4121570004	RADIATOR BRACKET (B)	4
50	4121571003	RADIATOR BRACKET (C)	4
51	—	—	
52	4121573001	BRACKET (B)	4
53	1050592101	BACK PANEL	1
54	4121574000	SHIELD BRACKET	1
55	1120430106	KNOB ASS'Y INPUT LEVEL	2
56	4140343005	SHIELD PLATE	1
★57	4450033005	WIRE CLAMP BAND	25
58	1441207005	INSIDE PANEL	1
59	4121562009	BRACKET	2
60	1441198004	FRONT PANEL ASS'Y	1
61	1140082000	KNOB GUIDE	1
62	1140083009	KNOB GUIDE	1
63	1430354008	WINDOW GLASS	1
64	—	—	
65	—	—	
66	1220089059	SPACER	2
67	1441206006	ESC BAR	2
68	1130476118	PUSH KNOB ASS'Y	1
69	1130477117	PUSH KNOB ASS'Y	2
70	4140344101	BRACKET	2
71	1441208004	VENTILATOR (F)	1

Means important safety item, which must be replaced, en necessary, by a part specified or meeting the specification the manufacturer.



NIPPON COLUMBIA CO., LTD.
No. 14-14, 4-CHOME AKASAKA,
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CABLE: NIPPONCOLUMBIA TOKYO

Printed in Japan

Ref. No.	Part No.	Part Name & Descriptions	
72	1441209003	VENTILATOR (B)	1
73	1011566008	TOP WOOD BOARD (F)	1
74	1011567007	TOP WOOD BOARD (B)	1
75	1011568006	WOOD BOARD	2
76	4620036007	TERMINAL CAP (BLACK)	2
77	4620036010	TERMINAL CAP (RED)	2
78	ETC0655B	ETC UNIT	1s
79	1220069079	SPACER	2
80	1220069008	SPACER	1
81	1090175106	VENTILATOR (A)	1
82	ETC0655B-2	ETC UNIT	1s
83	–	–	
84	–	–	
85	5130872006	DI MARK LABEL	
86	4150164070	SPACER	2
87	5139113009	RATING LABEL	
88	5130716023	FTZ LABEL	
SCREWS AND NUTS			**Q'ty**
301	4730454032	TAPPING SCREW (2) 4x8 (BLACK)	12
302	4730359014	TAPPING SCREW (2) 3x16	4
303	4730354035	TAPPING SCREW (2) 3x8 (BLACK)	67

Ref. No.	Part No.	Part Name & Descriptions	
304	4770064107	FIXING SCREW	57
305	4752005003	SPRING WASHER ϕ5	4
306	4700009006	PAN SCREW WITH S.W 3x6	4
307	4730304014	TAPPING SCREW (1) 3x8	17
308	SC-10822	NUT-WASHER	8
309	–	–	
310	4752006002	SPRING WASHER ϕ6	4
311	4756012005	NUT M6	4
312	–	–	
313	4730460013	TAPPING SCREW (2) 4x20	4
314	4700012022	PAN SCREW WITH W S.W 3x12	28
315	–	–	
316	4732355032	FLAT HEAD TAPPING SCREW (2) 3x10 (BLACK)	6
317	4711304033	PAN SCREW 3x8 (BLACK)	6
318	4751006016	WASHER ϕ5 (BLACK)	8
319	4711509032	PAN SCREW 5x16	8
320	4753202009	TOOTH WASHER ϕ4 (B)	4
321	4770233006	WASHER ϕ30	4
322	4700026005	TAPPING SCREW WITH W (2) 3x8	16
323	4730204017	TAPPING SCREW (1) 2.6x8	12
324	EP-4772	CORD HOLDER	8
325	4734354015	TAPPING SCREW (TRUS) 3x8	2

Ref. No.	Part No.	Part Name & Descriptions
PACKING & ACCESSORIES (not included EXPLODED VIEW.)		
a.	5040077030	PROTECTOR SHEET
b.	5040055007	CABINET SHEET
c.	5030426109	CUSHION
d.	5030427205	CUSHION
e.	5010909044	CARTON CASE
f.	5050061007	ENVELOPE
g.	5119120009	INST. MANUAL (A)
h.	5119121008	INST. MANUAL (B)
i.	5139113009	RATING SHEET
j.	5130872006	D. I MARK LABEL